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ABSTRACT

Hypnosis was combined with sensory and motor stimulation to remediate reversal problems in five children (6 1/2-9-years-old). Under hypnosis Ss were given the suggestion that they learn their numbers through feel and then given 1 hour of structured instruction daily for 10 days. Instruction stressed conditioning, vibratory memory, touch memory, and muscle memory and resulted in a decrease in reversal errors by children in the experimental group from 10 errors to 0 errors, while errors of the control group increased from 8 errors to 10 errors. Results suggested the possible benefits of vibratory furniture and hypnosis for young children and the possibility that childhood schizophrenia may be viewed as a severe perceptual problem. (DB)

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by

Gerald G. Jampolsky, M.D.
Staff Psychiatrist, CHILD Center, Kentfield, Calif.
Assistant Clinical Professor of Psychiatry,
U.C. Medical Center, S.F.

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The purpose of this paper is to share the results and possible implications of a pilot research project involving children who are having learning difficulties. The specific area chosen for study was reversal problems of children--namely, the child who may write numbers such as 7 or 3 backwards.

Reversal problems were chosen because for some children it is a sticky and not well understood area. In spite of much instruction, some of these children continue to make the same mistakes over and over again and become extremely frustrated in the learning situation. In reviewing the literature, there seemed to be no method of approach that would be uniformly helpful to these children in a short period of time. This is of practical importance, because such frustration can increase their poor self-esteem and effect other areas of their learning. For this reason, it was thought that if a method could be developed to help reversal problems, it might not only help their ego but might also be applied to other areas of learning.

This paper has been divided into five parts dealing with the following categories:

1) A superficial picture of the pilot project will be given.

2) Background information on the general status of learning problems in children.

3) A more detailed description of the process and findings of this project.

4) A brief discussion.

5) A summary and some possible implications and speculations that might be inferred from the findings.

Let us begin, then, with a running superficial picture of this project.

Ten children with reversal problems were picked from various school districts in Marin County, California. These children reversed one or more numbers in writing the numbers 1 to 10. At random, five children were put in an experimental group and five children in a control group.

The experimental group of children were exposed to a very specific and structured medical--educational--program of instruction. This involved, initially, treating the children as if they were blind. First they were all individually hypnotized. They were then exposed to one hour of instruction a day for ten days with a teacher. The techniques included operant conditioning, vibratory memory, touch memory, and muscle memory. After 10 days the results were that the children in the experimental group went from a total of 10 errors to 0 errors; those in the control group did not improve, and even were a little worse in that they went from 8 errors to 10 errors.

More details about this project will be given later.

Let us now go to the second part of the paper and attempt to review some of the vast complexities that surround children with learning problems.

It has been estimated that between 10 and 20% of the school population have learning problems.

Inspite of our best efforts, in the high school where the author consults and in almost any high school, one will find children of

normal and superior intelligence that are still writing, reading, and doing arithmetic on a 3rd or 4th grade level. Too often these children have not been diagnosed or have been improperly diagnosed, and we authorities have not known how to help them. Too often the parents have been erroneously blamed as the chief cause of the child's learning problem and frequently an erroneous psychiatric label has been put on the child. (1) It should be recognized, however, that a child who is two or more years behind in his learning skills is probably going to have some secondary emotional problems stemming from a lack of academic achievement.

In the author's opinion, the general problem of children with learning difficulties is still in a state of confusion. The highest of authorities are still in great disagreement about areas such as diagnosis, treatment, teaching, and remediation.

It is small wonder that parents of these children, as well as the children themselves, frequently find themselves with feelings of bewilderment, frustration, guilt, inadequacy, and futility.

Even the nomenclature we use tends to be fuzzy and often leads to more confusion rather than greater clarity.

Perhaps one is on safe ground in saying that children who have learning problems are a complex heterogeneous group of children. At times the causes of their difficulties and what to do about them may be clear and at other times the causes may be unclear and foggy. The professionals may not be at all clear about what to do.

With the above preface about the pitfalls of classification and

nomenclature, let us discuss at least a few of the more commonly used classifications of these children.

A good many authorities feel that at least some children's problems in learning may be due to the following reasons:

1) The child may have gross brain damage with gross neurological findings.
2) The child may be mentally retarded.
3) The child may have primary emotional problems resulting directly from disturbed communication between parent and child.
4) The child may have had limited or poor school opportunities or poor instruction.
5) The child may have a background history of lack of sensory stimuli and/or a lack of stimuli from interpersonal experiences.
6) The child may have a developmental learning disability resulting from a maturational lag of his nervous system.

Of course, children, being human, don't fall into neat categories and one frequently finds a combination of the above mentioned causes. The factor of particular importance is that these children frequently have as a common demoninator an understandably poor self-image.

It is categories 5 and 6 that the author wishes to emphasize. Rabinovich (2) describes these children as having a basic deficit in their capacity to integrate written material and to associate concepts and symbols. Various labels that do not necessarily mean the same

thing have been used to describe this latter group of children. Some of the labels that are sometimes put on these children are dyslexia, cerebral dysfunction, specific learning difficulty, atypical children, brain damage, and developmental learning disability.

Hertzig, Botner, and Birch (3) have recently begun a series of papers to point out the problems and to help clarify the use of the term "brain damage".

The author prefers the term "developmental learning disability" because it infers problems caused by faulty or delayed neurological maturation that results in symptoms of neurological disorganzation and non-synchrony. It is inferred that these problems can be caused by either the child being born with a slowly maturing neurological apparatus or being born normally but with a predisposition and sensitivity to stress and to a lack of sensory stimuli and experiences which can then cause a delay in the neurological maturation.

In all probability this is a hetero geneous group of children made up of many sub-groups of children.

In the author's opinion, the following are some of the common findings in children who have developmental disabilities.

The history reveals hyperactivity and short attention span in these children. A history of poor coordination and delayed speech or a speech impediment is common. The traditional neurological examination is usually negative. The so called "soft neurological signs" are common out with no evidence of a neurological disease. These children frequently don't know the difference between their right

and left sides. Eye dominance is often opposite to hand dominance and not infrequently these children are ambidexterous. Reversal of numbers and letters is common and reversals in speech are not uncommon. Difficulty in comprehending words relating to size and direction--such as "above" and "below", "big" and "small"--are common. Holding the pencil in writing is frequently clumsy for them. The child's drawing of a person is usually archaic.* Although these children can see and hear normally, they often have trouble integrating messages from these systems in the brain. Putting it another way, these children can be viewed as having a language disorder.

The history often shows that the parents felt that these children have been normal but more difficult to manage than the average child. On entering school, the child is frequently thought by the school to be immature. The child then may have difficulty in getting along with his peers. The child's difficulty in learning basic skills tends to lower his self-esteem. As the child enters 2nd and 3rd grades, he frequently feels further behind his peer group and his frustration of not meeting with success causes more emotional difficulties. At times the child is thought to be lazy and not really trying. The child rather rapidly develops a false self-image of being "dumb" or "stupid". This image develops in spite of the fact that the school intelligence tests have proven him to be of normal or above normal intelligence and that the parents really feel he is of normal intelligence.

Let us now return to a more detailed exposition of the pilot research study.

The Reed School District, Tiburon, California was utilized to roughly establish the normal incidence of reversals in the first three grades. 25% of the children beginning 1st grade had reversals in writing numbers 1 to 10; 8% had reversals at the end of 1st grade; 3% at the end of 2nd; and .5% at the end of 3rd grade.

In terms of this project, the author had the thought that visual clues were disturbing to these children. For this reason, it was thought that it might be intriguing to approach these children as if they were blind. This would mean that one would have to use other sensory modalities as a precursor to teaching them accurate visual perception. The assumption following Dr. Bach-y-Rita's (4) work is that the brain is plastic and would transfer learned sensations from other sensory modalities into visual perceptions. An article by Geldard (5) illuminates how the skin can learn a language.

In this rough pilot project 10 children with number reversal problems were selected at random. They ranged in age from 6½ to 9 years and gradewise from the end of the 1st to the end of 3rd grade. All the children were boys except for one girl in the experimental group.

Initially, each child in the experimental group was individually hypnotized by the author. Most of the literature about the approach to learning through hypnosis concerns itself with normal subjects with intact nervous systems. Articles by such people as Ambrose (6) & (7), Krippner (8), Oetting (9), and Mellenburch (10) show that they tend to use hypnosis primarily to alleviate anxiety and to increase concentration by suggestion.

It is the impression of the author with regard to the children in this project that even if anxiety was reduced they still would have difficulty in integrating visual messages to the brain. Hypnosis, therefore, was chosen with these children not only to reduce anxiety but to stimulate and heighten their awareness of sensory motor systems other than vision. The specific purpose of hypnosis was to increase stimulation of vibratory, touch, and motor messages to the brain.

The method of induction was not the usual way of inducing hypnosis in children. One of the more commonly used methods of induction with children is to make use of a visual stimuli by suggesting the child close his eyes and see a TV image. It is obvious that this method would not be appropriate with these children who were already suspected of having poor visual imagery. This point is supported by the work of Jacobs & Jacobs (11) who found that children who showed signs of neurological disorganization were more difficult to hypnotize using visual imagery as stimulation.

The author chose to use a method in obtaining light hypnosis that would make the utmost use of tactile and kinesthetic (motor and position sense) feedback to the brain.

The child was given a small piece of fur, and with his eyes closed, he was instructed to hold the fur next to his cheek and to feel a friendly warm furry animal. Other suggestions followed, making use of non-visual stimuli. An imaginary weight was tied to the arm which forced the arm down and an imaginary balloon was tied to the arm which lifted the arm. Standing upright, imaginary wind blowing

against the child's back pushed him into the author's arms. The suggestion was later made that the child would learn his numbers by feeling them rather than seeing them. While under hypnosis the learning procedure which would later be carried on by the teacher was gone over with the child. A post-hypnotic suggestion was given to the child that he would learn his numbers by feeling them.

Let us now examine the procedure that was used by the teacher and the pupil.

The initial part of the procedure was carried out with the child's eyes closed as if he were blind. For example, let us use the number 7. The child's head was used for his muscle memory. The teacher would move the child's head several times, making the number 7 (the head acted as the child's directionality antenna).

The head was chosen for the following reasons: 3 year olds tend to draw pictures of a person by making a head, arms, and legs coming out but with no body. The inference was made by the author that the 3 year old relates to the world via his head as the main spatial and directionality antenna to the outside world. Another reason is that it has been noted in the past that some of these children have a so called "mid-line problem". These children will draw a line with one hand and when they come to their mid-line they transfer the pencil into the other hand. The head, therefore, being in the mid-line was used in this experiment to avoid this problem.

The next step was to have the child move his head in the direction of the 7 by himself.

In the next step the author used a 4"x6" piece of plywood which he had manufactured with the number 7 grooved out of it. The child moved his fingers, with his eyes closed, over the grooved 7 to establish reinforcement for touch memory. While this procedure was going on, the teacher simultaneously made the number 7 on the child's back using a vibratory pencil. The vibratory pencil was developed by the author by modifying an electric toothbrush. A brass cup was soldered to the implement at the spot normally carrying the brush and a pencil was inserted into this cup. The vibratory pencil had the added advantage of weight and size that theoretically would give additional feedback to the brain.

In the next step, the child used the vibratory pencil by making a 7 through the grooved 7 with his eyes open.

Next, color reinforcement was used. As these children had right-left confusion, the words right and left were never used. A red tape was placed on the left side of a clipboard and green tape on the right side. The numbers 5, 6, and 9 became red numbers and all the rest were green because that was the direction in which the numbers started.

The next step had the child writing the number on a plain piece of paper. Initially, he would move his head making the number 7 and would then repeat this with the pencil following the direction of his head. This same procedure followed with other numbers.

The original thought was to expose these children to this teaching method one hour a day for four weeks. Because of lack of funds the teaching was terminated at the end of two weeks. The results

mentioned earlier were that the experimental group went from a total of 10 to 0 errors and the control group from 8 to 10 errors. There was one child in each group who to begin with had only one error and both of these children made zero errors after the initial two weeks.

After another two weeks, or a total of four weeks, the experimental group was revaluated. They had no instruction during this time. There were two children at this point that made errors. After three more hours of instruction there was only one child making a single error.

The inference is that perhaps four weeks of exposure to this method might be a more ideal time duration.

To reiterate, these children were taught to write their numbers by utilizing hypnosis to heighten their usage of sensory modalities other than vision.

Motor, touch, and vibratory memory were utilized and later color was used as another reinforcement. The child, therefore, did not have to make use of faulty visual clues and memory and did no have to resort to guess work in the visual area.

At this point additional funds were obtained from the Babcock Foundation to attempt to study these children. A psychiatric, neurological, and electroencephalographic study was done. One child in the control group chose not to participate in these studies, and one child in the experimental group did not have an EEG.

Neurological examinations were done by Dr. William Drake, The CHILD Center pedrologist who also administered a test which he has

developed, called the Perceptual Analysis Test.

Only one child had gross neurological findings, such as a Babinski. The other children examined showed 3 or more "soft neurological signs" but showed no evidence of neurological disease. Most of the children showed difficulty in the synchronizing of motor movements. All of the children showed evidence of confusion between right and left and showed spatial orientation problems. All of the children gave evidence of difficulty in integrating visual and auditory perceptions. Sequencing difficulty was uniformly found. Eye dominance in most of the children was on the opposite side of hand dominance.

All the children had abnormal EEG with the abnormality often being in the back and side areas of the brain.

How are these children in terms of intellectual functioning? Testing revealed all of these children to be of average or above average intelligence.

Next, the teachers were interviewed and the children's physicians contacted by The CHILD Center pediatrician, Dr. Bennett.

The results showed that according to the teacher, 90% of these children were having difficulty in interpersonal relationships with their peer group. 80% showed moderate evidence of learning difficulties. 70% were thought to be hyperactive in the school environment. 50% were thought to be poorly coordinated and to have a poor attention span.

Only two of the physicians were aware of any directionality and reversal problems.

Let us now turn to the psychiatric examinations which included histories from both parents as well as an interview with the child alone.

All of the children, except one in the control group, were seen by the author for the psychiatric examination. The findings were as follows:

All the children had a history of delayed speech development and some had histories of speech impediment.

70% of the children had a history of hyperactivity and were described as tense infants who were difficult to hold and cuddle. (As an aside, it is intriguing to wonder if a lack of touch and kinesthetic stimulation in infancy might have contributed in part to a faulty maturation of their perceptual apparatus.)

90% were described as having a poor attention span. All of the parents thought their children had normal intelligence. In terms of the psychiatric interview these children in general demonstrated an eagerness to learn. This is in contrast to many children seen by the author in the past who have primary emotional problems and are disinterested and bored with the learning process.

90% of the children had drawings that looked like the drawings of children much less their chronological age. An interesting finding was that 20% of these children drew pictures of a person starting at the bottom at the feet and going upward. (It is possible that this is a vertical perceptual difficulty or vertical reversal.)

80% of the children were low in their general fund of information

in terms of verbal questions. For example, only one child was able to state accurately who the President of the United States is.

All of the children examined had a marked tendency to be concrete and were almost totally lost in dealing with abstractions.

A high percentage--higher than the author would have considered; namely, 70%--had more fears than is usual for this age. These were such fears as fear of the dark, of heights, animals, etc.

All of the children were below average in handling sequencing. The parents frequently say, "I can only tell my child to do one thing at a time. If I give him two or three things, he gets mixed-up and falls apart."

None of the children know the days of the week or the months of the year in order. Most of them didn't know the alphabet. None of the children know that Christmas came in December. (One does not have to be a prophet to suggest that many of these children will probably have trouble in learning their multiplication tables, another area where sequencing is required.)

Most of the children were cooperative in the interview situation. The author saw no evidence of hyperactivity, except in one child. Only one child demonstrated a moderate amount of anxiety.

In general, expressive language seemed limited. In some, there was problem in receptive language. Most of the children talked about their family relationships in concrete terms. As an example, of their concreteness, a typical response to the question, "What is your brother like?" would be an answer that tells what the brother liked.

The author would be hard put to apply a psychiatric label on many of these children. A descriptive impression might be more to the point. In general they seem to have poor self-esteem. Their ability to deal with stimuli from the outer world, as well as the inner world, seemed loose and fragmented. They gave the impression of being unglued and seemed to be subtly asking for help in gluing themselves together. Putting it in still another way, their ego as well as their perceptual apparatus seemed like swiss cheese in that there seemed to be holes in them.

It is of interest to note that parents generally didn't consider their children to have problems until they entered school and were faced with a learning situation. "Immaturity" became a common label at that point. The parents were blamed and felt guilt for the child's difficulty in learning.

In discussion, let us look at research data from other sources that tends to support the use of sensory modalities as was done in this project.

Berlin (12), in his text on Early Childhood Education, points out research data that shows that sensory or motor stimulation can result in measurable cell growth in other areas of the brain. He also points out that passive movements of the limbs of young children can stimulate motor cells in the brain and bring about changes in the cells of the cerebral cortex in the frontal lobe.

Dr. William Drake (13) has reported in the literature the findings of a 12 year old boy with developmental learning disability

who died suduenly of a cerebral aneurysm. An autopsy of microscopic findings revealed immature cells in the parietal area of the brain.

The work of Americans, such as Fowler (14) and Hebb (15), and Russians, Makarenkov (16) and Chelovanova (17) point out the importance of early sensory stimulation if healthy maturation is to take place. (As described by A. A. V. Zaporozhets, Moscow, 1964)

Marion Newcomb (18), a previous team member in a project in Uruguay, has shared with the author a fascinating study which is taking place in Uruguay.

The children in the experimental group who were receiving multiple sensory stimulation beginning in infancy seemed to be showing evidence of increased maturation of the nervous system and more integrated learning than those in the control group.

Theoretically, in this reversal project, vibratory, motor, and touch sensations were used as alternative pathways to vision to get messages integrated in the brain. It might be plausible to consider that sensory stimulation herein described might also enhance the maturation of the neurological organization.

In summary, it must be stated that so small a pilot project cannot be solid evidence for any claims as to the effectiveness of this method in helping these children.

It may be realistic, however, to say that the results suggest that the method applied in this project may not only be helpful for children with reversal problems but may also be helpful in other areas of the child's learning. The neurological, psychiatric, and EEG data

tend to support the hypothesis that children with reversal problems have a neurological disorganization and that these children have other perceptual problems that may affect their ability to learn reading, writing, and arithmetic. It is inferred that this is a developmental maturational problem. It is also inferred that frequently we are harming these particular children by increasing their poor self-esteem when we expose them to a system of learning that can only lead to failure.

Last, what are some of the possible implications and speculations that might come from this study?

First, it is conceivable to the author that very young children may be helped by sleeping in a vibratory bed and later sitting in a vibratory chair. There has been very little research with the vibratory situation. It is exciting to speculate that such stimulation of the vibratory sense might cause reciprocal excitation in other parts of the brain and enhance the integration and maturation of brain cells.

Second, one might wonder if the use of hypnosis in a child prior to school entrance might help him become more aware and make better use of his sensory and motor modalities. It is intriguing to speculate whether the use of hypnosis in young children to enhance their sensory experiences might actually stimulate and change the electrical potential of the associative and integrative cells in the brain with the end result of an increase in the size of the brain cells and the resultant increase in integrative functioning. It is the

author's hope to do more research in this area.

A third, and last, speculation: Let us take a quick look into the problem of childhood schizophrenia where it is common for children to have perceptual problems. Is it possible that this entity might better be viewed as a more severe developmental learning disability? Using the swiss cheese analogy again, perhaps these children have tremendous holes in their perceptual apparatus that results in psychotic symptoms. And this entity might not be a psychiatric illness per se.

In conclusion, it can be said that his project as might be expected has raised more questions than it has answered. Hopefully, continued research in the area of hypnosis and in sensory and motor modalities might eventually pay dividends in helping these very interesting and intelligent children who are having difficulty in coping with the learning situation.

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